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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,372	09/16/2003	Hisashi Kobayashi	D-21,289	9409
27182	7590	11/18/2005	EXAMINER	
PRAXAIR, INC. LAW DEPARTMENT - M1 557 39 OLD RIDGEBURY ROAD DANBURY, CT 06810-5113			COCKS, JOSIAH C	
			ART UNIT	PAPER NUMBER
			3749	

DATE MAILED: 11/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/662,372	Applicant(s) KOBAYASHI ET AL.	
	Examiner Josiah Cocks	Art Unit 3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Request for Reconsideration

1. Receipt of applicant's response filed 9/7/2005 is acknowledged. This response includes arguments that the oxidant streams described in the Beer et al. reference result in a region of the core of the flame that is "oxygen depleted" and "fuel rich". Accordingly, applicant argues, this reference should be properly regarded as teaching away from adding an oxygen-rich stream to the flame (response, pp. 2-3). This argument is persuasive. After further review, the examiner considers that the teachings of Beer et al. relating to "complete combustion with low oxygen" and "depleted oxygen" are properly regarded as teaching away from adding an additional oxygen-rich stream. Accordingly, the rejection of applicant's claims based on Beer et al. are withdrawn.

However, rejections of the claims follow based on the newly discovered reference to Burge et al. As the Burge et al. reference was not previously relied upon by the examiner, this action is made non-final.

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless

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the references have been cited by the examiner on form PTO-892, they have not been considered.

In the response filed 9/7/2005, applicant indicated that an Information Disclosure Statement was being separately submitted. However, there does not appear to be an Information Disclosure Statement currently of record.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1-7, 9, 10-16, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,586,443 to Burge et al. ("Burge") in view of U.S. Patent No. 6,282,901 to Marin et al. ("Marin") (previously cited).

Burge discloses in the specification and figures 1-21 an invention in the same field of endeavor as applicant's invention and similar to that described in applicant's claims 1-7, 9, 10-16, 18, and 20. In particular, Burge shows a combustion method that reduces the amount of NO_x emitted including: providing a combustion device (10), and feeding primary air/oxidizing gas (through inlet 23) and fuel (63) into the device through a burner that comprises means for feeding secondary air (see inlet 24 and at least col. 16, lines 15-30) and tertiary air (see inlet 96 and at least col. 18, lines 9-41)) into the device. Burge notes that the oxidizing gas supplied to the combustion device may be air or pure oxygen (see col. 3, line 63) and that, dependent upon the type of fuel utilized, a nitrogen-rich stream may be introduced into the device as a carrier gas (see item 152, Fig. 13).

The examiner considers that either of the secondary or tertiary oxidizing gases (which as noted above may be pure oxygen) may be considered the oxygen-rich stream provided into the flame. Alternatively, Burge clearly teaches that "make-up" oxygen may be provided to the combustion device with a stream of air based on the specific nature of the fuel supplied (see col. 21, lines 3-7). This "make-up" oxygen may also be considered to be the oxygen-rich stream described in applicant's claims.

In regard to claim 10, the source of oxidizing gas (65) is properly considered to be from a source other than the burner.

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Burge possibly does not disclose that the air supplied is specifically separated outside the combustion device into an oxygen-rich stream and a nitrogen-rich stream or that a portion of flue gas is fed with the nitrogen-rich stream.

Marin teaches in Figures 1-4 a combustion method that is considered to be analogous art to both applicant's invention and Burge. In Marin, an air stream is separated into an oxygen-rich and nitrogen rich stream with the oxygen rich stream is feed with the fuel into a combustor flame and the entirety of a nitrogen rich stream is fed into a combustion device (see col. 4, lines 21-53). The nitrogen rich steam may be fed with a flue gas stream to the combustion device (see at least col. 8, lines 41-44).

Therefore, in regard to claims 1-7, 9, 10-16, 18, and 20, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combustion method of Burge to incorporate the air separation taught by Marin as this air separation process is recognized in the art as a means to produce separate nitrogen and oxygen rich stream which when fed to a combustion device aid in reducing undesirable gaseous emissions into the atmosphere (see Marin, col. 4, lines 9-14).

6. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burge in view of Marin as applied to claims 1 and 10 above, and further in view of U.S. Patent No. 4,257,763 to Reed ("Reed") (previously cited).

Marin in view of Burge teach all the limitations of claims 8 and 17 except that water is fed with the nitrogen-rich stream.

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Reed teaches a low NO_x burner and method of combustion using the burner that is considered to be analogous art to both applicant's invention and Burge. In Reed, liquid water (70) is supplied to mix with an air stream (see col. 4, lines 45-48).

Therefore, in regard to claims 8 and 17, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combustion method of Burge to incorporate adding liquid water to an air stream of a combustor as taught in Reed for the desirable purpose of providing NO_x reduction when combusted (see Reed, col. 4, lines 48-60).

7. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burge in view of Marin as applied to claim 10 above, and further in view of U.S. Patent No. 5,809,910 to Svendsen ("Svendssen") (previously cited).

Burge in view of Marin teach all the limitations of claim 19 except possibly for injecting a reducing agent that reacts with NO_x to form N₂ for NO_x reduction.

Svendssen teaches a combustion method that is considered analogous art to both applicant's invention and Burge. In Svendsen, a reducing agent (3) is injected that functions to reduce NO_x emissions from a combustion device (see at least col. 3, line 59, through col. 4, line 5).

Therefore, in regard to claim 19, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combustion method of Burge to incorporate injecting a reducing agent as taught in Svendsen to reduce the emission of

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undesirable compounds, such as NO_x, during the combustion process (see col. 3, line 59, through col. 4, line 5).

8. Claim 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,586,443 to Burge et al. ("Burge") in view of U.S. Patent No. 4,257,763 to Reed ("Reed") (previously cited).

Burge discloses in the specification and figures 1-21 an invention in the same field of endeavor as applicant's invention and similar to that described in applicant's claim 21. In particular, Burge shows a combustion method that reduces the amount of NO_x emitted including: providing a combustion device (10), and feeding primary air/oxidizing gas (through inlet 23) and fuel (63) into the device through a burner that comprises means for feeding secondary air (see inlet 24 and at least col. 16, lines 15-30) and tertiary air (see inlet 96 and at least col. 18, lines 9-41)) into the device. Burge notes that the oxidizing gas supplied to the combustion device may be air or pure oxygen (see col. 3, line 63) and that, dependent upon the type of fuel utilized, a nitrogen-rich stream may be introduced into the device as a carrier gas (see item 152, Fig. 13).

Burge does not disclose that water is fed with the nitrogen-rich stream.

Reed teaches a low NO_x burner and method of combustion using the burner that is considered to be analogous art to both applicant's invention and Burge. In Reed, liquid water (70) is supplied to mix with an air stream (see col. 4, lines 45-48).

Therefore, in regard to claims 8 and 17, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combustion method of Burge to incorporate adding liquid water to an air stream of a combustor as taught in Reed for

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the desirable purpose of providing NO_x reduction when combusted (see Reed, col. 4, lines 48-60).

Response to Arguments

9. Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. As the Burge reference is newly applied, this action is made non-final. A THREE (3) MONTH shortened statutory period for reply has been set. Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Josiah Cocks whose telephone number is (571) 272-4874. The examiner can normally be reached on weekdays from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg, can be reached at (571) 272-4828. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://portal.uspto.gov/external/portal/pair>. Any questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

jcc

November 16, 2005


JOSIAH COCKS
PRIMARY EXAMINER
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